

REMARKS/ARGUMENTS

Claims 1-21 are pending in the application. Claims 1-21 have been rejected as set forth hereinbelow. More specifically, the Examiner has rejected Claims 10 and 11 and 13-20 pursuant to 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,024,239 to Turner et al. (the '239 patent). Claims 1-9, 12 and 21 are rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over the '239 patent in view of U.S. Patent No. 6,260,728 to Turner et al. (the '728 patent). More specifically, the Examiner has rejected the aforementioned claims based on the '239 patent and the '728 patent stating that with respect to the dimensional limitations of the score origination loop, the length of the first and second legs of the cent bead, the residual score thickness, and the frangible score loop that these dimensions are "a matter of routine optimization that is well known within the knowledge of one of ordinary skill in the art."

The Examiner has rejected the pending claims based on an assertion that the improvements set forth in the Applicant's claims are matters of routine optimization that are well within the knowledge of one of ordinary skill in the art and relying on the case of In re Boesch, 617 Fed. 2nd 272, (CCPA 1980).

However, In re Boesch can clearly be distinguished from the present case. In re Boesch is a chemical case related to claims for a nickel based alloy with ranges of constituents which were clearly disclosed by the ranges disclosed in the prior art. Thus, the court held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. See In re Boesch @ 276.

In the present application, the Applicant has identified and claimed at least three distinct elements in a container end closure which are critical for success, not one result effective variable in a known process. Each of these distinct features are interrelated in a manner which requires more than the mere optimization of the variables for satisfactory performance. These variables include the size of the score origination loop, the positioning and size of the reinforcing cent bead, and the orientation of the horseshoe-shaped void region surrounding the pull tab. These elements were designed and redesigned during an extensive one year engineering effort to solve the problems associated with the end closures described and taught in the prior art '239 patent and '728 patent, namely tear panel detachment and premature opening. To date, over 60 billion beverage container end closures have been sold which utilize the new design without a known failure, which is a significant and remarkable improvement over the prior art pull tab designs which had on average of 22 failures per year.

Furthermore, the '239 and '728 patents cited by the Examiner never address the relationship between the 3 variables claimed in the Applicant's invention, and the patent claims are not specifically related to the problems addressed by the Applicant. Rather, the novelty of the '239 patent is related to the central webbing of the tab having a "rivet island" at least partially surrounded by a void region to provide an exposed area of the central panel and, a curvilinear bead in the central panel being located entirely in said exposed area." See the '239 patent claims. This configuration was designed to reduce slack metal in the central panel, which created inefficiency and reduced leverage when a force was applied to the pull tab. See the '239 patent, page 1, lines 48-52.

The '728 patent claims were directed specifically to "a secondary score groove positioned adjacent the second end of the primary score and adjacent said hinge segment to direct the fracture of the metal near the hinge segment in a direction away from the second end of the score." See the '728 patent claims. Thus, the '728 patent specifically addressed a secondary score groove to address the problem related to tab "tuck unders" and tear panel detachment, but did not recognize the associated factors of the orientation of the rivet island void region, the length of the cent bead legs, or the radius of the score origination loop.

The Applicant's invention as set forth in the claims is directed to solving numerous problems simultaneously. More specifically, due to the industry preference of utilizing larger opening tear panels to improve pour rate, a greater force is required on the nose of the pull tab to tear the score line and open the tear panel. To help reduce the force required to shear the score line, the score residual (material thickness) in prior art end closures was ultimately reduced, which unfortunately created the problem of premature openings, especially when carbonated beverages become inadvertently shaken during transportation and/or become heated. Even more problematic than a premature opening is the unwanted detachment of the tear panel from the central panel, which in rare instances can be ingested, and which is a function of the geometry of the score origination loop, score residual, pull tab orientation and length of the legs of the cent bead.

To address the aforementioned problems, the Applicant completely redesigned the end closure disclosed in the prior art cited by the Examiner. This engineering evolution involved changing at least 3 distinct variables at one time, and identifying the relationship

between the 3 variables, and not merely the routine optimization of a known, single variable as set forth in In re Boesch. Furthermore, as opposed to the facts in In re Boesch, where it was well known and documented in the prior art references that changing certain ranges in constituents in an alloy would change the performance of the alloy, there is no teaching in the prior art '239 patent and '728 patent that all three of the variables in the claimed invention are interrelated and critical to the pull tab opening force, prevention of pull tab "tuck unders" and the prevention of tear panel detachment.

Where the results of optimizing a variable are exceptionally good, the discovery of an optimum value of a variable is not obvious. In re Waymouth, 499 F.2d 1273 (CCPA 1974.) Furthermore, where a parameter which is optimized is not recognized to be a result effective variable, it is not obvious. In re Antonie, 559 F.2d 618 (CCPA 1977).

In In re Antonie, the Applicant claimed a wastewater treatment device which utilized semi-immersed contactor discs which were continuously rotated to aerate the immersed portions that grew on the contactors. In a case with facts analogous to the Applicant's invention, the prior art reference taught the basic structure of the device, but was silent regarding the quantitative design parameters, and specifically with regard to the ratio of the tank volume to contactor area of 0.12 gal./sq. ft. Although initially rejected by the Examiner as obvious as a matter of optimizing efficiency based on mere mechanical experimentation, the Court held that the invention was not obvious where the parameter that was optimized was not recognized to be a result effective variable, or where the result of optimizing a variable was unexpectedly good. In re Antoine at 620.

A prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. In re Bell, 991 F.2d 781, 782 (Fed. Cir. 1993). Where the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference. In re Yates, 663 F.2d 1054 (CCPA 1981).

Although each of the structural elements claimed in the Applicant's invention are shown in the prior art, i.e., a pull tab, a score line with origination loop, and a cent bead, there is no suggestion or teaching regarding the specific geometry for each component, nor how these elements are specifically interrelated to provide the superior results obtained by the Applicant's invention. More specifically, the Applicant's invention as set forth in the pending claims includes:

- a) a score origination loop with a radius of curvature of at least about 0.050 inches;
- b) a reinforcing cent bead with legs no longer than about 0.125 inches; and
- c) a horseshoe shaped void region located around the rivet of the pull tab and having a first leg extending a greater distance than a second leg.

It is only by optimizing these three distinct variables in conjunction with the score residual (material thickness) that the end closure of the present invention is capable of

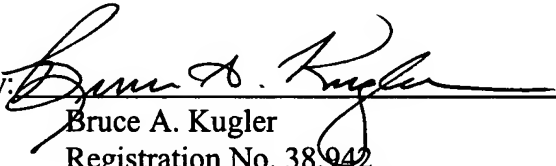
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achieving the incredible results confirmed by sales of over 60 billion beverage containers and end closures without a known failure.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and respectfully requests a Notice of Allowance and Issue Fee Due at the Examiner's earliest convenience. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned attorney at 303-863-2992.

Respectfully submitted,

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